

APPENDIX

ACRONYMS AND ABBREVIATIONS

ADEOS	Japanese spacecraft, launched 1996	IPCC	Intergovernmental Panel on Climate Change
AES	Atmospheric Environment Service	IR	Infrared
AGCM	Atmospheric General Circulation Model	ISTS	Institute for Space and Terrestrial Science
ASHOE	Airborne Southern Hemisphere Ozone Experiment	JPL	Jet Propulsion Laboratory, California
ATMOS	Atmospheric Trace Molecule Spectroscopy	LITE	Lidar In-space Technology Experiment
BCC	Basal Cell Carcinoma	MAESA	Measurements for Assessing the Effects of Supersonic Aircraft
BUV	Backscattered Ultraviolet	MAI	Middle Atmosphere Initiative
BWF	Biological Weighting Factor	MOPITT	Measurement of Pollution in the Troposphere
CCCma	Canadian Centre for Climate Modelling and Analysis	NASA	National Aeronautics and Space Administration
CFC	Chlorofluorocarbon	NDSC	Network for the Detection of Stratospheric Change
CIE	Commission Internationale de l'éclairage	NOAA	National Oceanic and Atmospheric Administration
CLAES	Cryogenic Limb Array Spectrometer, on UARS	NWP	Numerical Weather Prediction
CMAM	Canadian Middle Atmosphere Model	OA	Objectively Analysed
CMC	Canadian Meteorological Centre	ODIN	Satellite of the Swedish Space Corporation
CMOS	Canadian Meteorological and Oceanographic Society	OSIRIS	Optical Spectrograph and Infrared Imaging System
CRISTA	Cryogenic Infrared Spectrometers and Telescopes for the Atmosphere	PSC	Polar Stratospheric Cloud
CSA	Canadian Space Agency	QBO	Quasi-Biennial Oscillation
CTM	Chemical Transport Model	RAF	Radiometric Amplification Factor
DMS	Dimethyl Sulphide	SAGE	Stratospheric Aerosol and Gas Experiment
DMSP	Dimethylsulphoniopropionate	SBUV	Solar Backscatter Ultraviolet
DNA	Deoxyribonucleic Acid	SCC	Squamous Cell Carcinoma
DOC	Dissolved Organic Carbon	SEF	Spectral Finite Element forecast model
ECC	Electrochemical Concentration Cell	SPADE	Stratospheric Photochemistry, Aerosols, and Dynamics Experiment
ECMWF	European Centre for Medium Range Weather Forecasting	SPARC	Stratospheric Processes and their Role in Climate
ENSO	El Niño Southern Oscillation	STE	Stratospheric-Tropospheric Exchange
ENVISAT	ESA satellite scheduled for launch in 1999	STRAT	Stratospheric Tracers of Atmospheric Transport
ER-2	High altitude research aircraft operated by NASA	TOMS	Total Ozone Mapping Spectrometer
ERS-2	Earth Resources Satellite 2, of the ESA	TOVS	Tiros Operational Vertical Sounder
ESA	European Space Agency	UARS	Upper Atmosphere Research Satellite
FASCD	Fast Atmospheric Signature Code	UNEP	United Nations Environment Programme
FTIR	Fourier Transform Infrared spectrometer	UQAM	University of Quebec at Montreal
GCM	General Circulation Model	UV	Ultraviolet
GOME	Global Ozone Monitoring Experiment	VOC	Volatile Organic Compound
GSFC	Goddard Space Flight Center, NASA	WHO	World Health Organization
HALOE	Halogen Occultation Experiment, on UARS	WMO	World Meteorological Organization
HCFC	Hydrogenated Chlorofluorocarbon	WOUDC	World Ozone and UV Data Centre

GLOSSARY

Aerosol A suspension, in a gaseous medium, of solid particles, liquid particles, or solid and liquid particles.

Albedo The ratio of the amount of electromagnetic radiation reflected by a body to the amount incident upon it, commonly expressed as a percentage.

Atmospheric General Circulation Model (AGCM) Computer simulations of the global atmosphere's general circulation.

Brewer Brewer Total Ozone Spectrophotometer.

Calibration The determination, by measurement or comparison with a standard, of the accuracy of a measuring instrument.

Characterization The assessment of the response of an instrument to variations in factors other than those intended to be measured (e.g., temperature response, time constant, linearity of response).

Chlorofluorocarbons (CFCs) Hydrocarbons in which the hydrogen atoms have been replaced by chlorine and fluorine atoms.

Dobson Dobson Total Ozone Instrument

Dobson Unit (DU) The standard unit for total ozone (100DU = 1mm at standard temperature and pressure).

Flux Transfer of power onto, or across, a surface, expressed in watts. Flux is often used incorrectly in place of irradiance. However, flux density, being power per unit area, is the same as irradiance.

Greenhouse Effect Heating effect exerted by the atmosphere upon the earth because the atmosphere absorbs and reemits infrared radiation. The functional analogy to a greenhouse is false.

Greenhouse Gas A gas in the atmosphere that emits infrared radiation.

Halons Proprietary trade name for brominated CFCs.

Infrared Radiation (IR) Electromagnetic radiation whose wavelengths lie in the range of 0.8 μm to 10,000 μm (see also short-wave and long-wave).

Intensity Same as radiance.

Interferometer Optical instrument using the twin-beam or multibeam interference of light to make measurements with high spectral resolution. Also known as a Fourier Transform Spectrometer.

Irradiance The power transferred onto, or across, a unit area of surface by radiation from all directions within a hemisphere. The surface is usually horizontal. Measured in Wm^{-2} .

Irradiation The energy transferred onto, or across, a unit area of surface by radiation from all directions within a hemisphere during some specified period (e.g., per day). Measured in Jm^{-2} .

Lidar Optical equivalent of radar, in which pulsed radiation from a laser is transmitted upwards into the atmosphere and the return radiation is measured as a function of time.

Long-wave Radiation Radiation in the 4–100 μm wavelength range, usually referring to what is emitted by the earth or atmosphere.

Methane (CH_4) A colourless, odourless gas that is lighter than air, having strong infrared absorption bands at 3.3, 3.8, and 7.7 μm .

Nadir The point on the celestial sphere vertically below the observer, or 180 degrees from the zenith.

Nitrous Oxide (N_2O) A colourless, sweet-tasting gas that is slightly soluble in water. It has strong infrared absorption bands at 4.5 and 7.8 μm .

Optical Depth A measure of atmospheric transmission, specifically the negative of the natural logarithm of the transmission of the direct beam.

Ozone (O_3) A gaseous allotrope of oxygen with three atoms per molecule.

Ozone Hole A dramatic if not precise description of the area of low ozone values that has developed during spring in the Antarctic since about 1980.

Potential temperature The temperature a parcel of air would acquire if compressed to standard pressure (101.325 kPa).

Radiance The electromagnetic power originating from a given direction and transferred across a unit surface normal to that direction. Measured in $\text{Wm}^{-2} \text{sr}^{-1}$. Also called Intensity.

Radiative Transfer Transmission of energy by electromagnetic radiation.

Radiometer Instrument for measuring radiation.

Short-wave Radiation Radiation with wavelengths less than $4.0\ \mu\text{m}$. In atmospheric physics this is mostly solar radiation.

Spectral Irradiance Spectrally resolved irradiance, i.e. power per unit area per unit wavelength interval. Units $\text{Wm}^{-2}\ \mu\text{m}^{-1}$.

Spectral Radiance Spectrally resolved radiance, i.e., power per unit area per unit wavelength interval per unit solid angle. Measured in $\text{Wm}^{-2}\ \text{sr}^{-1}\ \mu\text{m}^{-1}$.

Spectroradiometer An instrument used to measure spectral radiance or irradiance at many wavelengths.

Spectrometer An instrument used to measure spectral radiance or irradiance at many wavelengths (i.e., the same as a spectroradiometer).

Spectrophotometer An instrument that measures spectral irradiance or spectral radiance at a few wavelengths.

Stratosphere Region of the atmosphere extending approximately from 10 km to 50 km in altitude. Temperature generally increases with height, and the radiation balance controls the temperature distribution in this region.

Total Ozone Usually specified as the thickness of a layer of pure ozone at standard temperature and pressure that would contain the same number of ozone molecules as that in the vertical atmospheric column above a given point on the earth's surface. A typical value is 3 mm or 300 DU.

Tropopause The atmospheric boundary between the troposphere and the stratosphere, usually characterized by an abrupt change in the lapse rate. The altitude of the tropopause varies between 15–20 km in the tropics and 8 km in polar regions.

Troposphere The lower layers of the atmosphere extending from the surface to a height of between 8 and 20 km. The region is characterized by a general decrease in temperature with altitude.

Ultraviolet (UV) Radiation with wavelengths in the range of 100–400 nm, commonly divided into UV-A (400–315 nm), UV-B (315–280 nm), and UV-C (280–100 nm).

Umkehr Effect The term Umkehr (German, meaning reversal or return) comes from the description of the graph of the logarithm of the ratio of zenith sky radiances at two UV wavelengths plotted against the solar zenith angle. The graph has a stationary value and can be used to infer the ozone profile (Umkehr method).

Window (spectral) A region of the spectrum where there is little atmospheric absorption.

Zenith Angle The angle between a particular direction and the local vertical.